Patent Claims

1. A method for the controlled dosage of a medicament as a function of time, consisting of the following steps:

   a) Specification of an indication- and substance-dependent target profile, which indicates a desired concentration-time profile or a desired effect-time profile,

   b) Physiology-based pharmacokinetic and/or pharmacodynamic simulation with a time-variable application profile while taking into account individual anatomical, physiological and/or genetic parameters of the body to be treated and substance-specific input parameters of the medicament to be administered,

   c) Iterative numerical adaptation of the application profile until the simulated time profile matches the predetermined target profile,

   d) Control of a dosage device on the basis of the result in c).

2. The method as claimed in claim 1, characterized in that the dosage of the medicament is carried out on humans or animals.

3. The method as claimed in claim 1, characterized in that the type of application is one of the following types: intravenous application, intra-arterial application, intraperitoneal application, intramuscular application, subcutaneous application, topical application, oral application or inhalative application.

4. The method as claimed in claim 1, characterized in that the patient's individual parameters to be taken into account are a selection from the following: blood flow rates, volumes and composition (water, fat and protein components) of individual organs, gene expression data of metabolically active enzymes or active transporters.

5. The method as claimed in claim 1, characterized in that the substance-specific parameters to be taken into account are a selection from the following: lipophilicity, binding constants to plasma proteins, free fraction in plasma, solubility (in the aqueous system or in artificial intestinal fluid), permeability coefficient, molar mass, molar volume, organ/plasma or organ/blood distribution coefficient.

6. The method as claimed in claim 1, characterized in that one of the following numerical optimization methods is used as the method for adapting the application profile: gradient

methods, in particular quasi-Newton or Newton methods; gradient-free methods such as nested intervals; stochastic methods such as Monte-Carlo methods.

7. The method as claimed in claim 1, characterized in that the dosage device is an electronically controlled infusion pump, an inhaler or an electronically controlled release capsule for oral application.

8. The method as claimed in claim 4, characterized in that one or more of the anatomical, physiological and/or genetic parameters may be time-variable.

9. The method as claimed in claim 4, characterized in that one or more of the anatomical, physiological and/or genetic parameters are measured in real-time during the application.

10. The method as claimed in claim 1, characterized in that the success of the therapy is additionally monitored online by one or more suitable measurement probes and their measurement signal or measurement signals are co-employed in order to control the dosage device.